

What is claimed is:

1. An imaging system switching device comprising:

a first roller;

5 a reflector swinging in a predetermined angle;

a lens disposed between the first roller and the reflector;

an optical receiver receiving optical scanning signals and transforming the optical scanning signals into digital signals while the imaging system switching device is scanning an input document;

10 an optical transmitter generating optical output signals while the imaging system switching device is printing an output document; and

an optical switch capable of switching optical signal transmitting paths;

wherein while the imaging system switching device is scanning the input document, the first roller rotates the input document and cooperates with the reflector swinging in the predetermined angle to scan the whole input document and generate the optical scanning signals, the optical scanning signals are transmitted to the reflector by way of the lens, the reflector reflects the optical scanning signals to the optical switch by way of the lens, the optical switch transmits the optical scanning signals to the optical receiver, and the optical receiver transfers the optical scanning signals to the digital signals; and

20 while the imaging system switching device is printing the output document, the optical transmitter generates the optical output signals to the optical switch, the optical switch transmits the optical output signals to the reflector by way of the lens, the reflector swings in the predetermined angle and cooperate with a rotation of the first roller so that the optical output signals are transmitted to the first roller by way of the

lens to form an electrostatic latent image thereon, and the electrostatic latent image with toner is transferred to an output medium.

2. The imaging system switching device of claim 1, wherein the imaging system  
5 switching device scans the input document and prints the input document so as to execute a copy procedure.

3. The imaging system switching device of claim 1, wherein the imaging system  
switching device scans the input document and utilizes a telephone device to transmit  
10 the input document to a remote fax machine so as to execute a fax procedure.

4. The imaging system switching device of claim 1, wherein the optical  
transmitter is a light emitting diode (LED) or a laser diode.

15 5. The imaging system switching device of claim 1, wherein the optical receiver comprises a photo diode.

6. The imaging system switching device of claim 1, wherein the optical switch is  
a mechanical optical switch, a Micro Electro Mechanical System (MEMS) optical  
20 switch, a beam splitter, a total internal reflection (TIR) prism, or an optical router.

7. The imaging system switching device of claim 1, wherein the imaging system  
switching device further comprises an original roller and the optical switch is an  
optical path routing device, wherein the optical path routing device simultaneously  
25 transmits the optical output signals to the first roller and the optical scanning signals to

the optical receiver to form the electrostatic latent image and the digital signals, respectively, so that the imaging system switching device scans the input document and prints the output document simultaneously.

5           8. The imaging system switching device of claim 7, wherein the optical path routing device is a beam splitter, a total internal reflection (TIR) prism, or an optical router.

10           9. The imaging system switching device of claim 1, wherein the optical transmitter generates light streams to light up the input document by way of the optical switch, the lens, and the reflector, simultaneous with the optical receiver receiving the optical scanning signals formed by the light streams and transferring the optical scanning signals to the digital signals while the imaging system switching device is scanning the input document.

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10. An imaging system switching device with dual roller be utilized in a multi-function office machine, the multi-function office machine providing a printing function, a scanning function, and a copy function, the image system switching device comprising:

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a first roller;

a second roller;

a reflector swinging in a predetermined angle;

a lens disposed among the first roller, the second roller, and the reflector;

an optical receiver receiving optical scanning signals and transforming the

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optical scanning signals into digital signals while the imaging system switching device

is scanning an input document;

an optical transmitter generating optical output signals while the imaging system switching device is printing an output document; and

an optical path routing device transmitting the optical output signals to the first  
5 roller and the optical scanning signals to the optical receiver;

wherein while the imaging system switching device is scanning the input document, the second roller rotates the input document and cooperates with the reflector swinging in the predetermined angle to scan the whole input document and generate the optical scanning signals, the optical scanning signals are transmitted to the  
10 reflector by way of the lens, the reflector reflects the optical scanning signals to the optical path routing device by way of the lens, the optical path routing device transmits the optical scanning signals to the optical receiver, and the optical receiver transfers the optical scanning signals to the digital signals; and

while the imaging system switching device is printing the output document, the  
15 optical transmitter generates the optical output signals to the optical path routing device, the optical path routing device transmits the optical output signals to the reflector by way of the lens, the reflector swings in the predetermined angle and cooperates with a rotation of the first roller so that the optical output signals are transmitted to the first roller by way of the lens to form an electrostatic latent image  
20 thereon, and the electrostatic latent image with toner is transferred to an output medium.

11. The imaging system switching device of claim 10, wherein the imaging system switching device scans the input document with the second roller and prints the  
25 input document with the first roller so as to execute a copy procedure.

12. The imaging system switching device of claim 10, wherein the optical transmitter is a light emitting diode (LED) or a laser diode.

5        13. The imaging system switching device of claim 10, wherein the optical receiver comprises a photo diode.

10       14. The imaging system switching device of claim 10, wherein the optical path routing device is a beam splitter, a total internal reflection (TIR) prism, or an optical router.

15       15. The imaging system switching device of claim 10, wherein the imaging system switching device scans the input document and utilizes a telephone device to transmit the input document to a remote fax machine so as to execute a fax procedure.

16. The imaging system switching device of claim 10, wherein the first roller is a photo conductive drum.

20       17. An imaging system switching device comprising:  
a first roller;  
a reflector swinging in a predetermined angle;  
lens disposed between the first roller and the reflector;  
an optical receiver receiving optical scanning signals and transformed into digital signals while the imaging system switching device is scanning an input  
25       document;

an optical transmitter generating lighting streams; and

an optical switch transmitting the lighting streams to the first roller and the optical scanning signals to the optical receiver;

wherein the first roller rotates the input document and cooperates with the reflector swinging in the predetermined angle to scan the whole input document and generate the optical scanning signals, the optical scanning signals are transmitted to the reflector by way of the lens, the reflector reflects the optical scanning signals to the optical switch by way of the lens, the optical switch transmits the optical scanning signals to the optical receiver, and the optical receiver transfers the optical scanning signals to the digital signals while the imaging system switching device is scanning the input document, and the lighting streams generated by the optical transmitter utilize a reverse transmission path from the optical switch to the first roller to light up the input document for scanning.

18. The imaging system switching device of claim 17, wherein the optical transmitter is a light emitting diode (LED) or a laser diode.

19. The imaging system switching device of claim 17, wherein the optical receiver comprises a photo diode.

20. The imaging system switching device of claim 17, wherein the optical switch comprises a beam splitter.